S/137/61/000/012/123/149
A006/A101

AUTHORS: Rodichev, A.M., Savchenko, M.K.

TITLE: The Barkhausen mechanical effect in single crystals of transformer steel

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 12, 1961, 33, abstract 12Zh246 (V sb. "Magnitn. struktura ferromagnetikov", Novosibirsk, Sib. otd. AN SSSR, 1960, 151 - 153)

TEXT: Investigations were made with flat transformer steel specimens of 30x2.8x0.4 mm dimensions, consisting of a single crystal and cut out of a sheet in such a manner that the planes [110] were inclined to the specimen surface not more than at 3 - 4°. The specimens were annealed in a vacuum at 1,000-1,100°C for several hours with subsequent slow cooling. Tension of the crystals was performed on a device equipped with a special mechanism, which made it possible to change the speed of load application within a wide range. Medium and most probable amplitude of Barkhausen discontinuities are calculated. With a higher loading speed the number of discontinuities decreases and their amplitude in-

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The Barkhausen mechanical effect ...

creases. The distribution of discontinuities over the amplitudes during tension is analogous to the distribution of Barkhausen discontinuities during magnetization. The effect of changes in the loading speed is analogous to the effect of changes in the magnetization rate.

M. Matveyeva

[Abstracter's note: Complete translation]

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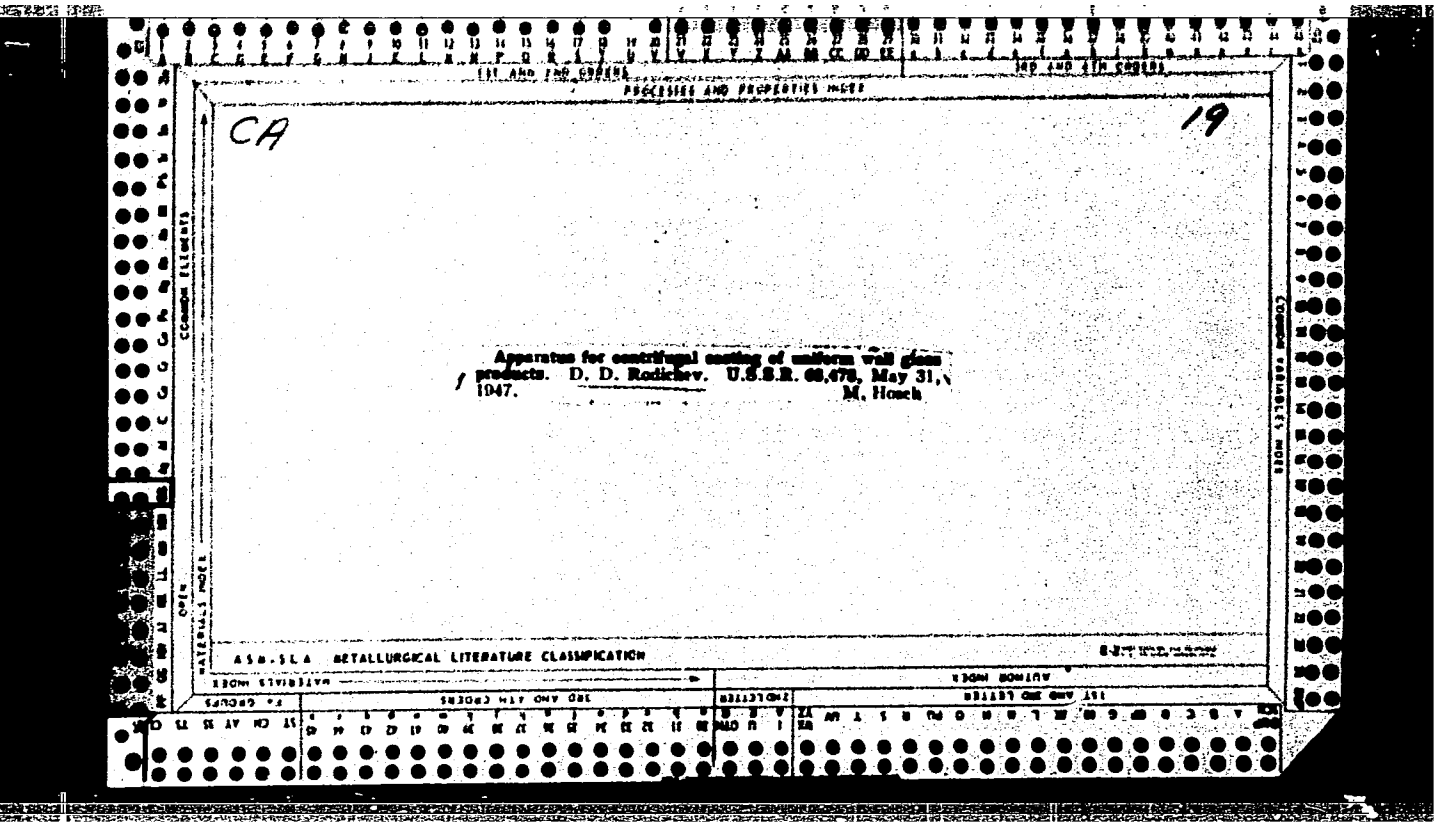

GUBANOV, I.I.; ALEKSEYEV, M.G.; KHITIK, P.I., inzhener, redaktor; RODICHEV, F.I. inzhener, redaktor; KANDYKIN, tekhnicheskiy redaktor.

[Work on diesel locomotives] Opyt raboty na teplovozakh. Moskva, Gos. transp.zhel-dor.izd-vo, 1951. 14 p. (Microfilm) (MLRA 9:5)
(Diesel locomotives)

GURSKIY, P.A.; RODICHEV, F.I., redaktor; KHITROV, P.A., tekhnicheskiy redaktor.

[Results of traction and heat engineering tests of type 1-3-1 series Su locomotives] Rezul'taty tiagovo-teplotekhnicheskikh ispytanii parovoza tipa 1-3-1 serii Su. Moskva, Gos.transp.zhel.-dor. izd-vo, 1952. 234 p. (Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut zheleznodorozhnogo transporta. Trudy, no.54) (MLRA 10:2)
(Locomotives--Testing)

KIRENSKIY, L.V.; RODICHEV, G.M.

Study of the law of approach to saturation using nickel-silicon alloys. Izv.vys.ucheb.zav.; fiz. no.4:144-151 '58.
(MIRA 11:11)

1. Krasnoyarskiy pedinstitut.
(Nickel-silicon alloys) (Magnetism)

KIRENSKIY, L.V.; RODICHEV, G.M.

Law of the approach to saturation investigated with a small-diameter sample of nickel. Izv.vys.ucheb.zav.; fiz. no.5:27-34 '58. (MIRA 12:1)

1. Krasnoyarskiy pedinstitut.
(Nickel) (Magnetism)

RODICHEV, G.M.; KIM, P.D.

Method of investigation of the Barkhausen effect. Izv.vys.ucheb. zav.;fiz. no.1:130-135 '62. (MIRA 15:6)

1. Krasnoyarskiy politekhnicheskiy institut.
(Magnetism)

KIM, P.D.; RODICHEV, G.M.

Large Barkhausen jumps in the magnetization of thin ferromagnetic films. Izv. AN SSSR. Ser. fiz. 26 no.2:306-310 F '62.
(MIRA 15:2)

1. Krasnoyarskiy politekhnicheskiy institut.
(Ferromagnetism)

SOV/139-58-4-24/30

AUTHORS: Kirenskiy, L. V. and Rodichev, G. M.

TITLE: Investigation on Alloys of Nickel with Silicon of the Law of Approach to Saturation (Issledovaniye zakona priblizheniya k nasyshcheniyu na splavakh nikelya s kremniyem)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, 1958, Nr 4, pp 144-151 (USSR)

ABSTRACT: The behaviour of polycrystalline ferromagnetics in strong fields has been the subject of numerous experimental and theoretical investigations (Refs 1-15), as a result of which the law of approach to saturation has been formulated thus:

$$\dot{I} = \dot{I}_s \left(1 - \frac{a}{H} - \frac{b}{H^2} - \frac{c}{H^3}\right) + \dot{I}_p, \qquad (1)$$

$$\chi = \frac{A}{H^2} + \frac{B}{H^3} + \frac{C}{H^4} + \chi_p \qquad (2)$$

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Investigation on Alloys of Nickel with Silicon of the Law of Approach to Saturation

where $\dot{I}$ is the magnetisation of the ferromagnetic in a magnetic field of the potential H;

$\dot{I}_s$ - spontaneous magnetisation;

$\dot{I}_p$ - magnetisation caused by the paraprocess,

χ - differential susceptibility;

χ_p - susceptibility of the paraprocess;

a,b,c and A,B,C - coefficients dependent on the magnetic constants of the ferromagnetics and also on the internal and external stress and the non-magnetic inclusions.

Most of the published work on investigating the law of approach to saturation has been carried out on pure ferromagnetic materials and the authors of this paper

Investigation on Alloys of Nickel with Silicon of the Law of Approach to Saturation

considered it of interest to investigate this law on alloys, choosing for this purpose alloys of nickel with silicon. The dependence is investigated of the coefficients in the law of approach to saturation on the silicon content and also the dependence of the susceptibility of the paraprocess on the magnetising field. Sirce alloys of nickel with silicon have a low Curie point, it can be anticipated that in these the paraprocess will be very pronounced and, therefore, it can be investigated in relatively weak fields. According to the theory of Holstein and Primakoff (Ref 7), the dependence on the field of the susceptibility of the paraprocess can be expressed by the relation:

$$\chi_p = p/H^{1/2}$$

This dependence was experimentally detected only by

Investigation on Alloys of Nickel with Silicon of the Law of Approach to Saturation

Parfenov (Ref 15); other investigators were unable to detect this dependence since in their investigations the range of the applied fields was not large enough. The authors of this paper investigated the dependence on the field of the differential susceptibility χ using a test rig which is described by the authors in another paper (Ref 16). 17 to 18 cm long, 1 mm dia. specimens containing 4, 3 and 0.5% Si and also of 0.4 mm dia. containing 2% Si were tested at 22°C. In Fig.1 the dependence of χH^3 on H is graphed for non-annealed specimens containing 0.5, 3 and 4% Si. In Fig.2 the same dependence is graphed for equal but annealed specimens. In Fig.3 the dependence is graphed of $\chi H^{3/2}$ on H for annealed specimens containing 3 and 4% Si. In Fig. 4 the dependence of χ on $H^{-1/2}$ is graphed for annealed specimens containing 4% Si. Other determined relations

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are graphed in Figs. 5-8. The following conclusions are arrived at: for the investigated Ni-Si alloys the applicability of the law of approach to saturation is shifted towards the range of weaker fields and this enabled investigation on these alloys of the susceptibility of the paraprocess. It was found that the susceptibility of the paraprocess can be expressed by the equation:

$$\chi = p/H^{1/2},$$

p being a constant. The determined dependence of the coefficient p on the Si content enabled determining the value of this coefficient for pure nickel by extrapolation. The thus determined value of the coefficient p is near to its theoretical value calculated by means of the theory of Holstein and Primakoff and, as regards its order of magnitude, it is in agreement with the results obtained by Parfenov (Ref 15). Measurements on specimens containing 4% Si have shown that the expression for the differential susceptibility for such specimens contains a term r which is independent of the field. The

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Investigation on Alloys of Nickel with Silicon of the Law of Approach to Saturation

coefficients A, B and C and also the anisotropy constant K_1 decrease with increasing Si content whereby the decrease is rapid at first and slows down later. There are 8 figures and 18 references, 11 of which are Soviet, 6 English, 1 German.

ASSOCIATION: Krasnoyarskiy pedinstitut (Krasnoyarsk Pedagogic Institute)

SUBMITTED: February 10, 1958

Card 6/6

36392
S/139/62/000/001/021/032
E032/E314

94.2200

AUTHORS: Rodichev, G.M. and Kim, P.D.

TITLE: On a method of studying the Barkhausen effect

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, no. 1, 1962, 130 - 135

TEXT: It is pointed out that in spite of the large number of both experimental and theoretical papers on the Barkhausen effect, there appears to be some controversy about the best method of determining the magnetic moment of the Barkhausen "jumps". K.M. Polivanov, A.M. Rodichev and V.A. Ignatchenko (Ref. 3 FMM, 9, no. 5, 778, 1960) have reported that in order to determine the magnetic-moment distribution of the "jumps", the usual amplifiers must be followed by an electronic integrator. The necessity of using an integrator was deduced from considerations which did not take into account the effect of the measuring coil on the form and duration of the pulse. The transient process in the measuring coil was discussed by R.S. Tebble et al (Ref. 1 - Proc.Phys.Soc., 63, 139, 1950) but

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these calculations are said to be subject to a number of limitations and therefore the present authors have extended them to a more general case. The conclusion is that the integral of the voltage pulse at the output of an amplifier should be proportional to the magnetic moment of the region subjected to magnetization reversal. Moreover, the magnetic moments may also be determined from the pulse amplitude, provided the measuring coil has a sufficiently large time constant. The present authors have also carried out an experimental study of the pulse-length distribution of the Barkhausen pulses. A circuit is described whereby the magnetic-moment distribution can be determined. The measurements were carried out on iron films obtained by vacuum evaporation onto cylindrical glass tubes. The thickness of the films was of the order of 5 000 Å. Four different measuring coils were employed and it was found that the pulse-length distribution is very dependent on the particular coil employed. The pulses are longer for larger

coils. When the time constant of the coil is sufficiently large, the pulses have roughly the same length. The maximum pulse length obtained was 2.5 μs.
There are 3 figures and 1 table.

ASSOCIATION: Krasnoyarskiy politekhnicheskiy institut
(Krasnoyarsk Polytechnical Institute)

SUBMITTED: September 12, 1960

Card 3/3

RODICHEV, G.M.; KIM, P.D.

Research on the duration of Barkhausen jumps in an iron film.
Izv.AN SSSR.Ser.fiz. 25 no.5:610-613 My '61. (MIRA 14:5)

1. Krasnoyarskiy politekhnicheskiy institut.
(Metallic films--Magnetic properties)

SOV/139-58-5-6/35

AUTHORS: Kirenskiy, L. V. and Rodichev, G. M.

TITLE: Investigation of an Approximate (Magnetic) Saturation Law for Small Diameter Nickel Sample (Issledovaniye zakona priblizheniya k nasyshcheniyu na nikelevom obraztse malogo diametra)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, fizika, 1958, Nr 5, pp 27-34 (USSR)

ABSTRACT: Numerous theories have been proposed to account for the observed fact that the intensity of magnetization in ferromagnetics saturates to a constant value no matter how much the applied magnetizing field is increased beyond the value required to induce this saturation. The saturation formulae have the general form:

$$I = A I_s + \chi H$$

where I is the intensity of magnetization corresponding to an applied field H, I_s is the intensity of spontaneous magnetization for zero applied field, and A, χ are coefficients which depend in a somewhat complicated way on H. The expressions for A, χ are usually given as series expansions in H^{-1} and the various theories differ in the values they assign to the coefficients and constant terms in these expansions. Depending on the model assumed, these

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Investigation of an Approximate (Magnetic) Saturation Law for Small Diameter Nickel Sample

quantities are more or less dependent on temperature, crystalline structure, magnetic history and geometrical dimensions of the sample of ferromagnetic under consideration. The present paper reports on an investigation of the saturation properties of a 0.43 mm diameter sample of nickel using fields H ranging up to approximately 10^4 oersteds. A high frequency ferroresonance circuit was used with the nickel sample forming the core of one of the inductances. The output voltage wave-form was analysed in terms of the circuit constants for various applied fields and in this way a curve of I against H was obtained; in particular the circuit constants were adjusted to permit a large number of closely spaced readings to be taken in the region of the saturation field. An approximate analytic representation for the I-H curve is obtained by taking:

$$A = 1 - \frac{b}{H^2}$$

in the above formula, with b (at room temperature) equal to

Investigation of an Approximate (Magnetic) Saturation Law for Small Diameter Nickel Sample

$-4I_s^{-2} \times 10^3$; and by expanding the susceptibility χ as:

$$\chi = \frac{A}{H^2} + \frac{B}{H^3} + \frac{C}{H^4} + \chi_r \quad .$$

It is shown that the last two terms on the right can in fact be replaced for practical purposes by a single term p/H . In this simplified formula for χ the following (room temperature) values are assigned to the numerical coefficients:

$A = 1{,}197 \times 10^3$; $B = 6{,}614 \times 10^5$; $p = 0{,}01$.

The paper contains 4 figures and 23 references, 12 of which are Soviet, 5 German, 5 English and 1 French.

ASSOCIATION: Krasnoyarskiy pedinstitut (Krasnoyarsk Teaching Institute)

SUBMITTED: February 10, 1958.

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25798
S/048/61/025/005/012/024
B117/B201

24.2200

AUTHORS: Rodichev, G. M., and Kim, P. D.

TITLE: Study of the duration of Barkhausen jumps in an iron film

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25, no. 5, 1961, 610-613

TEXT: The present investigation was the subject of a lecture delivered at a symposium on thin ferromagnetic films (Krasnoyarsk, July 4 to 7, 1960). The magnetic reversal jumps in a film were examined as a function of their duration. In the system used for the investigation a test coil applied to the specimen served as pick-up. The specimen was subjected to magnetic reversal in a slowly changing magnetic field. The coil was connected to the amplifier. The voltage pulses caused by the magnetic reversal jumps were, after amplification, transmitted to a converter unit, and at the output had amplitudes that were proportional to the duration of the pulses at the input. The pulses received by the converter unit were sorted as to their amplitudes with the aid of a pulse-height discriminator and counted with the aid of scalers. The system used gave the possibility of recording

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pulses starting from 0.2 μsec. Most of the elements of the system were the same as are generally used for studying the Barkhausen effect. The converter unit constituted an exception. The circuit diagram of this unit (Fig. 1) was constructed in a way as not only to allow the pulse number to be studied as a function of the respective duration, but also to permit the pulses caused by the Barkhausen jumps to be integrated, i.e., it was possible to study the distribution of the jumps according to the magnetic moments (Ref. 2: Polivanov K. M., Rodichev A. M., Ignatchenko V. A., Fizika metallov i metallovedeniye 9, vyp. 5, 778 (1960)). The pulses of the converter unit were, prior to their transmission to the pulse-height discriminator, amplified by a one-stage amplifier. The system was calibrated with the aid of a generator for rectangular pulses of the type МГИ-1 (MGI-1). The amplifier placed in front of the converter unit had a transmission band of from 0.5 kilocycles to 2.5 megacycles. The amplification could be varied within a wide range. The highest amplification factor amounted to $5 \cdot 10^5$. An iron film produced by sputtering in vacuum was the object of the investigation. The backing was a $0.5 \cdot 20 \cdot 0.2$ mm glass plate. The film was about 2000 Å thick. The axis of easiest magnetizing was oriented along the plate and during the measurements was

Study of the duration of...

in coincidence with the axis of the magnetizing solenoid and the test coil. Calculations have shown that form and duration of the voltage pulse at the input of the amplifier depends to a large extent on the time constant of the test coil. To allow the duration of the voltage pulse at the input of the amplifier to equate the duration of the change of the magnetic current during the magnetic reversal jump, coils of the least possible time constant must be used. This can be achieved by reducing the diameter of the wire used for winding, as well as the diameter and length of the winding. An enamel-insulated wire 0.02 mm in diameter was used. A further diminution of the time constant of the coil could be attained by a smaller number of turns. This, however, could give rise to an undesired diminution of the pulses and their number. It has bee possible to find coil dimensions being such that their further reduction left the character of the pulse distribution curves unchanged. Although the coils differed from one another greatly (100 and 290 turns) the curves displayed the same form. The effect of the coils upon the pulse duration may therefore be considered to be negligible. In a film of 2000 Å only a minor number of pulses was found to have a duration of over 1.5 μsec. The majority of pulses was found to fall to a duration of about

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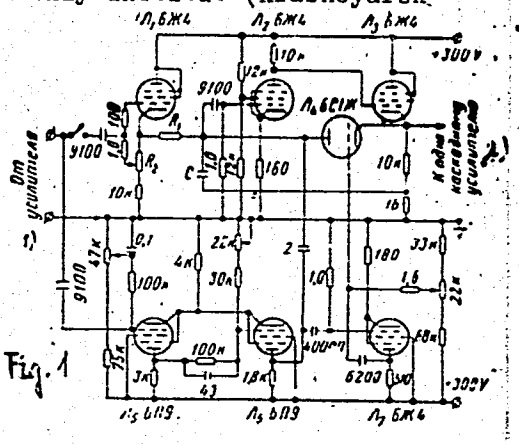
0.5 μsec, whereas the maximum of the jumps in a massive specimen of a relatively small diameter corresponded to a duration of about 1 μsec. N. M. Salanskiy, V. I. Sinegubov are mentioned. There are 4 figures and 2 Soviet-bloc references.

ASSOCIATION: Krasnoyarskiy politekhnicheskiy institut (Krasnoyarsk Polytechnic Institute)



Legend to Fig. 1: basic circuit diagram of converter unit. 1, from amplifier; 2, to one-stage amplifier; $Л_1$ (L_1), $Л_2$ (L_2), $Л_3$ (L_3), $Л_7$ (L_7) tubes of the type 6Ж4 (6Zh4); $Л_4$ (L_4) - triode of the type 6С1Ж (6S1Zh); $Л_5$ (L_5) and $Л_6$ (L_6) - tubes of the type 6П9 (6P9); R_1 - resistor; R_2 - potentiometer; C - capacitor.

Fig. 1

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RODICHEV, I.K.

Penetration of solar radiation into the snow cover. Mat.k uch.o merz.zon.zem.kory no.8:44-52 '62. (MIRA 16:3)
(Solar radiation) (Snow)

RODICHEV, S.D.

Urgent tasks of cotton procurement workers. Tekst.prom. 14 no.7:1-3 Jl '54. (MLRA 7:8)

1. Nachal'nik Glavzagotkhlopproma.
(Cotton trade)

RODICHEV, S. D.

"A Strong Raw Materials Base for the Textile Indus.," 11 pp. Russian, Tekstil Prom., No. 4, Moscow, 1947

RODICHEV, S.D., inzhener.

Centralized drying and ginning of raw cotton. Tekst. prom. 16 no.8:4-6 Ag '56. (MLRA 9:10)

(Cotton gins and ginning) (Cotton--Drying)

RODICHEV, S.D., inzhener.

Development of cotton ginning during the sixth five-year plan.
Tekst.prom. 16 no.10:16-18 O '56. (MLRA 10:1)
(Cotton gins and ginning)

RODICHEV, S.D.

What the quality of silk depends on. Nauka i pered. op. v sel'khoz. 7 no.5:6-7 My '57. (MLRA 10:6)

1. Nachal'nik upravleniya tekstil'nogo syr'ya Ministerstva legkoy promyshlennosti SSSR.

(Sericulture)

RODICHEV, S.D.

Restore lost millimeters. Nauka i pered. op. v sel'khoz. 7 no.4:5-8 Ap '57. (MLRA 10:6)

1. Nachal'nik upravleniya tekstil'nogo syr'ya Ministerstva legkoy promyshlennosti SSSR.

(Cotton growing)

RODICHEV, S.D.

Use the right organization for the procuring, receiving, and processing of raw cotton from the new harvest. Tekst.prom. 21 no.9:1-4 S '61. (MIRA 14:10)

1. Chlen Gosudarstvennogo komiteta zagotovok Soveta Ministrov SSSR.
(Cotton industry)

RODICHEV, S.D.

Ways of increasing the raw material supply for the knit goods industry. Tekst.prom. 21 no.3:13-16 Mr '61. (MIRA 14:3)

1. Nachal'nik Soyuzglavlegpromsyr'ye pri Gosplane SSSR.
(Knit goods industry)

MUKHAMEDZHANOV, M.V.; UL'DZHABAYEV, T.U.; MAMEDOV, M.T.; RODICHEV, S.D.; FIRSOV, B.P. Prinimali uchastiye: PROTASOV, P.V.; POLEVSHCHIKOVA, V.N.; MAL'TSEV, A.M. PEVZNER, L.I., red.; BONDARENKO, M., red.; BAKHTIYAROV, A., tekhred.

[On cotton plantations of the U.S.A.] Na khlopkovykh plantatsiiakh SShA. Tashkent, Gos.izd-vo Uzbekskoi SSR, 1959. 172 p. (MIRA 13:10)

(United States--Cotton growing)

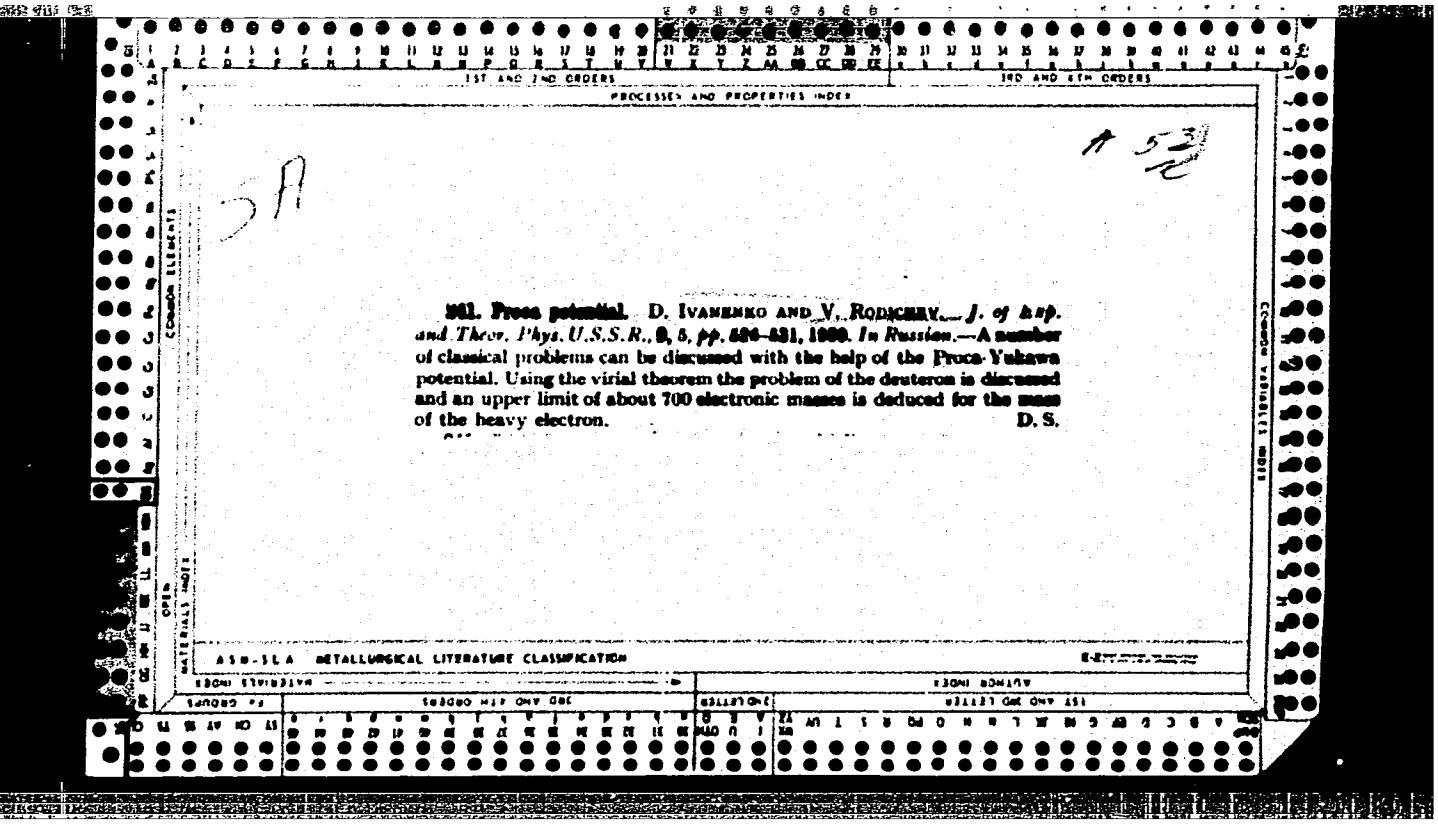
RODICHEV, S.D.; MERKIN, I.B.; MILOKHOV, N.I.; POPELLO, A.P.; SOLOV'YEV, N.D.; SHEMSHURIN, N.A.; SORKIN, N.B., retsenzent; SMIRNOV, I.I., retsenzent; ANDREYEV, Yu.I., retsenzent; BRAVYY, Z.A., retsenzent; SOKOLOVA, V.Ye., red.; MEDVEDEV, L.Ya., tekhn.red.

[Handbook on the primary processing of cotton] Spravochnik po pervichnoi obrabotke khlopka. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po legkoi promyshl., 1959. 687 p. (MIRA 13:4)
(Cotton gins and ginning)

Rodichev, S.D.

RODICHEV, S.D., inzh.

Development of raw materials for the cotton textile industry. (MIRA 10:12)
Tekst.prom. 17 no.11:20-23 N '57.
(Cotton gins and ginning)



1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

5A

A 53

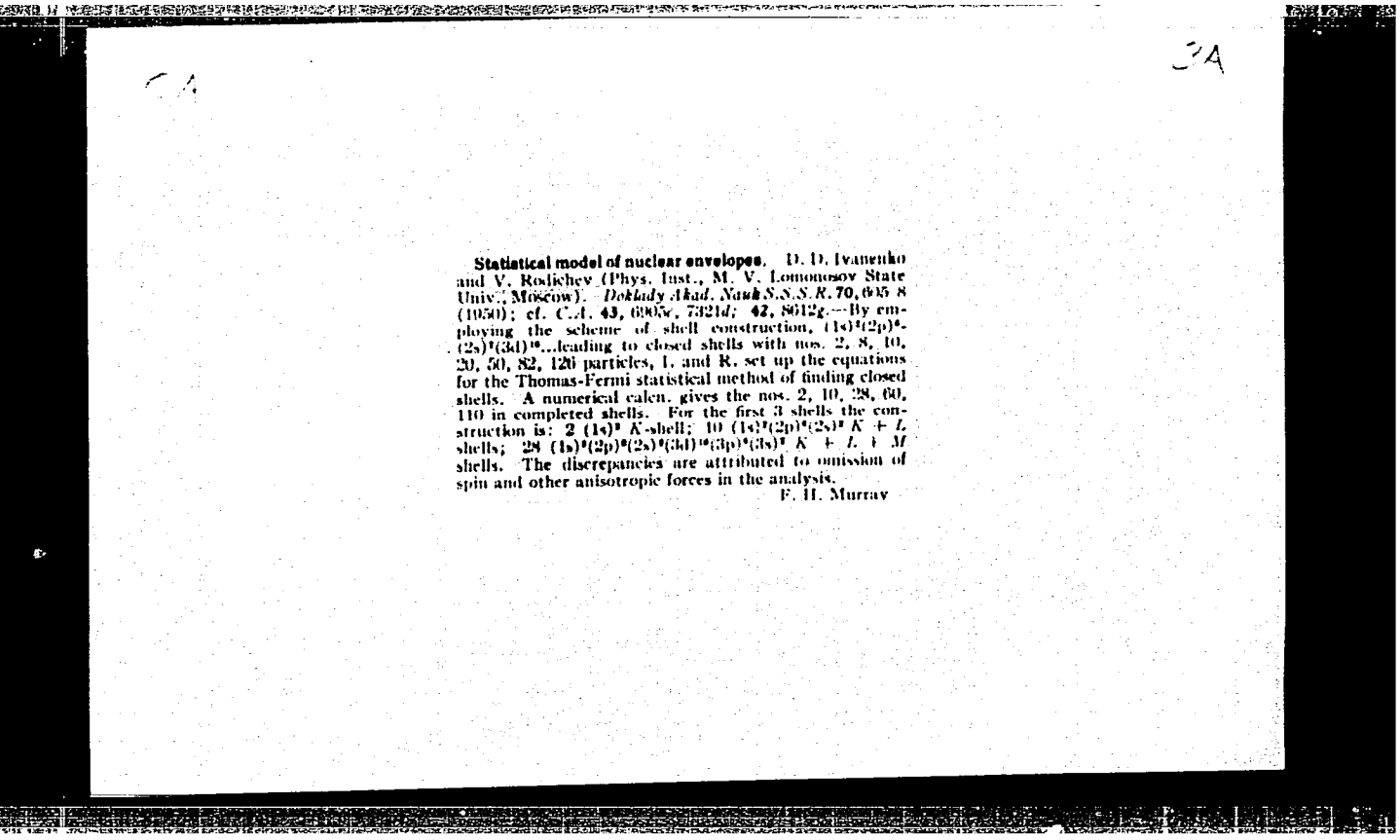
961. Proca potential. D. Ivanenko and V. Rodichev. *J. of Exp. and Theor. Phys. U.S.S.R.*, **9**, 5, *pp.* 626–631, 1939. *In Russian.*—A number of classical problems can be discussed with the help of the Proca-Yukawa potential. Using the virial theorem the problem of the deuteron is discussed and an upper limit of about 700 electronic masses is deduced for the mass of the heavy electron. D. S.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

5A

Statistical model of nuclear envelopes. D. D. Ivanenko and V. Rodichev. *Guide Russ. Sci. Periodical Lit. Brookhaven Natl. Lab.* 3, 313-16(1951)(English translation). — See C. A. 44, 9805f. F. J. C.

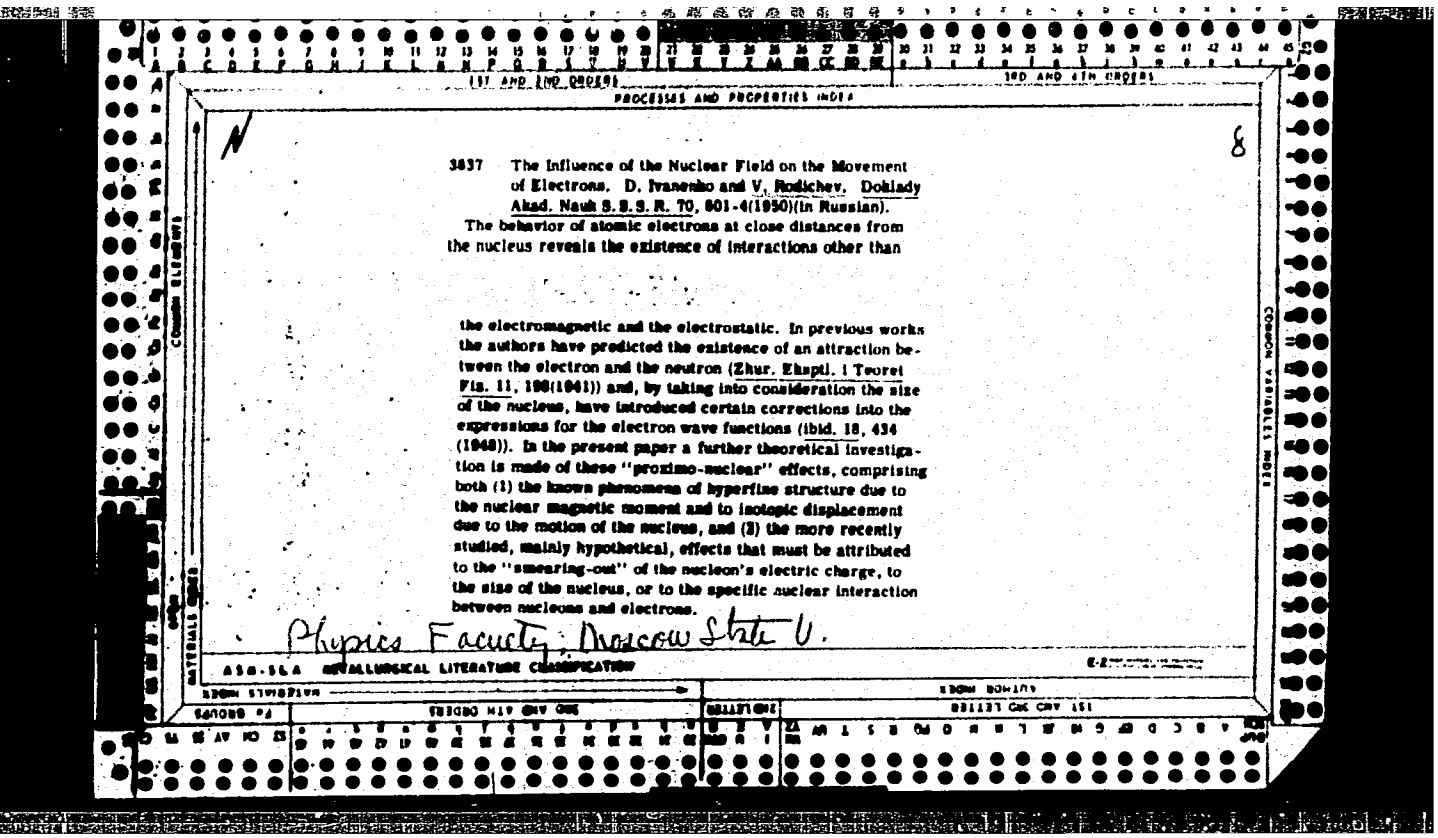


C.A.

3A

Statistical model of nuclear envelopes. D. D. Ivanenko and V. Roslichev (Phys. Inst., M. V. Lomonosov State Univ., Moscow). *Doklady Akad. Nauk S.S.S.R.* **70**, 605-8 (1950); cf. *C.A.* **43**, 6805*e*, 7321*d*; **42**, 8012*g*.—By employing the scheme of shell construction, $(1s)^2(2p)^6(2s)^2(3d)^{10}$...leading to closed shells with nos. 2, 8, 10, 20, 50, 82, 126 particles, I. and R. set up the equations for the Thomas-Fermi statistical method of finding closed shells. A numerical calcn. gives the nos. 2, 10, 28, 60, 110 in completed shells. For the first 3 shells the construction is: 2 $(1s)^2$ *K*-shell; 10 $(1s)^2(2p)^6(2s)^2$ *K* + *L* shells; 28 $(1s)^2(2p)^6(2s)^2(3d)^{10}(3p)^6(3s)^2$ *K* + *L* + *M* shells. The discrepancies are attributed to omission of spin and other anisotropic forces in the analysis.

F. H. Murray



PROCESSES AND PROPERTIES INDEX

3837 The Influence of the Nuclear Field on the Movement of Electrons. D. Ivanenko and V. Rodichev. Doklady Akad. Nauk S.S.S.R. 70, 801-4(1950)(In Russian).

The behavior of atomic electrons at close distances from the nucleus reveals the existence of interactions other than the electromagnetic and the electrostatic. In previous works the authors have predicted the existence of an attraction between the electron and the neutron (Zhur. Eksptl. i Teoret Fiz. 11, 198(1941)) and, by taking into consideration the size of the nucleus, have introduced certain corrections into the expressions for the electron wave functions (ibid. 18, 434 (1948)). In the present paper a further theoretical investigation is made of these "proximo-nuclear" effects, comprising both (1) the known phenomena of hyperfine structure due to the nuclear magnetic moment and to isotopic displacement due to the motion of the nucleus, and (2) the more recently studied, mainly hypothetical, effects that must be attributed to the "smearing-out" of the nucleon's electric charge, to the size of the nucleus, or to the specific nuclear interaction between nucleons and electrons.

Physics Faculty, Moscow State U.

530.145

4985. Some of the results of generalized field theory. V. I. Rodičev. *Zh. Eksper. Teor. Fiz.*, **21**, 869–78 (*No.* 8, 1951) *In Russian*.

The generalized field is presented in a form of an antisymmetrical 5-tensor of 2-*d* rank, the components of which are formed, in the same way as the curl, from a dependent 5-vector (A_x, A_y, A_z, i_φ, A_s) and independent 5-vector (x, y, z, ict, s), where the first three components of each 5-vector form a 3-dimensional vector, A_s is a pseudo-scalar, and s is also a pseudo-scalar playing the part of a time in a system of co-ordinates with reference to which a given system is 4-dimensionally at rest. It is assumed that the tensor field has no "sources" and therefore it satisfies 5-dimensional continuity equations. Out of 10 components of this antisymmetrical tensor, having different absolute values, 6 are components of the electro-magnetic field, 3 are the components of a 3-dimensional vector interpreted as an integral of the "meson current density" with respect to s, and one component is a scalar interpreted as an integral of the "meson charge density" with respect to s. This structure of the tensor yields the equations of meson field, including the e.m. equations, in 3-dimensionally vectorial form, and also the 5-dimensional wave equation (which in addition to the Dalambertian operator includes the second derivative with respect to s) for each component. Two quantized particular solutions of these wave equations are discussed in some detail: plane waves and spherical waves. The former solution is obtained in the form of an exponential with a complex argument, while the latter solution is developed in terms of Hankel functions of the first kind, spherical harmonics, and Gegenbauer's polynoms. The expressions for the symmetrical energy-impulse tensor are then derived, from which formulae are drawn for the calculation of the forces arising from the exchange energies. A more general solution of the 5-dimensional wave equation for the components of the quantized meson field is then obtained in the form of a multiple Fourier series.

N. S. JAPOLSKY

FODICHEV, V. I.

"On Meson Decay." Thesis for degree of Cand. Physico-Mathematical Sci. Sub 9 Nov 1950, Moscow Oblast Pedagogical Inst.

Summary 71, 4 Sep 52, Dissertations Presented for Degrees in Science and Engineering in Moscow in 1950. From Vechernyaya Moskva, Jan-Dec 1950.

RODICHEV, V.I.

5901

Rodičev, V. I. Some results of the general theory of fields. Akad. Nauk SSSR. Žurnal Eksper. Teoret. Fiz. 21, 869–878 (1951). (Russian)

Vector fields for mesons of fixed rest-mass are generalized to fields which represent a superposition of fields of continuously varying rest-mass. This is accomplished by having the field depend on five field variables A_τ ($\tau=0,4$) which are functions of five variables x^τ. The variables A_τ and x^τ for $\tau=1,2,3,4$ are four-vectors while A_0 and x^0 are pseudo-scalars with respect to Lorentz transformations. x^0 is the variable conjugate to the rest-mass. Field variables satisfy a five-dimensional wave equation. Single-valuedness of its solutions implies that the field can exist only in states which are quantized with respect to the rest-mass distribution. Formulas for the components of the energy-momentum tensor and related quantities are obtained.

A. J. Coleman (Toronto, Ont.).

Source: Mathematical Reviews, Vol 13 No. 5

RODICHEV, V.I.

Space with torsion, and nonlinear field equations. Izv. vys. ucheb. zav.; fiz no.6:118-125 '61. (MIRA 15:1)

1. Moskovskiy oblastnoy pedagogicheskiy institut imeni N.K. Krupskoy.

(Spaces, Generalized)
(Differential equations)

RODICHEV, V.I.

Twisted space and nonlinear field equations. Zhur. eksp. i teor. fiz. 40 no.5:1469-1472 My '61. (MIRA 14:7)

1. Moskovskiy oblastnoy pedagogicheskiy institut.
(Field theory) (Spinor analysis)

RODICHEV, V. I.

"A Tetrad Interpretation of The Einsteinian Theory of Gravitation"

report presented at the Intl. Conference on Relativistic Theories of Gravitation, Warsaw, Poland, 25-31 July 1962.

Moscow District Pedagogical Inst., Moscow, USSR,

RODICHEV, V.I.

Spaces with torsion and generalized equations of the spinor field. Izv.vys.ucheb.zav.;fiz.no.2:122-124 '63. (MIRA 16:5)

1. Moskovskiy oblastnoy pedagogicheskiy institut imeni Krupskoy.
(Hyperspace) (Spinor analysis)

L 39401-65 EWP(m)/EWT(1)/EEC(t)/T Pg-4/Pl-4/Po-4/Pq-4 IJP(c)

ACCESSION NR: AP5006064 S/0139/65/000/001/0142/0151

32
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B

AUTHOR: Rodichev, V. I. 21

TITLE: Einstein's theory of gravitation in the representation of orthogonal reference frames

SOURCE: IVUZ. Fizika, no. 1, 1965, 142-151

TOPIC TAGS: gravitation, general relativity, Einstein equation

ABSTRACT: The author describes first the difficulties in gravitational theory, connected with the nonlocalizability of the energy of the gravitational field. He then introduces a representation of a non-inertial coordinate system by means of orthogonal reference frames, which makes it possible to separate the concepts of coordinate grid (holonomic system of coordinates) from the analytic representation of the non-inertial reference system (nonhomonomic, locally orthogonal system of coordinates), something which cannot be done in the usual formalism of the general theory of relativity. All the physical quantities involved in the theory of gravitation (potentials, field intensity and induction, energy momentum density, angular

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L 39401-65

ACCESSION NR: AP5006064

2

momentum) are in the new formulation general-covariant tensors relative to the group of arbitrary holonomic coordinate transformation, but not relative to the group of local orthogonal transformations. A special gauge condition is introduced to eliminate inessential intertial forces. All the results are obtained within the framework of Riemannian geometry. "The author thanks Professor D. D. Ivanenko for interesting discussions on these questions." Orig. art. has: 61 formulas.

ASSOCIATION: Moskovskiy pedagogicheskiy institut imeni N. K. Krupskoy (Moscow Pedagogical Institute)

SUBMITTED: 10Jul63 ENCL: 00 SUB CODE: GP

NR REF SOV: 005 OTHER: 003

Card 2/2 nb

RODICHEV, V.I.

Einstein's theory of gravitation in the representation of orthogonal frames of reference. Izv. vys. ucheb. zav.; fiz. 8 no.1:142-151 '65. (MIRA 18:3)

1. Moskovskiy pedagogicheskiy institut imeni Krupskoy.

ZHURIN, R.B.; RODICHEVA, D.I.; CHARTORIYSKIY, B.A.

Schiff bases, derivatives of N,N-diethyl-p-phenylenediamine. Zhur.ob.khim. 33 no.10:3360-3364 O '63. (MIRA 16:11)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley.

ACCESSION NR: AP4018385 S/0120/64/000/001/0176/0177

AUTHOR: Yershov, R. Ye.; Rodicheva, E. K.; Volgina, Z. M.

TITLE: Using ferroprobes in determination of magnetic rigidity of thin ferromagnetic films

SOURCE: Pribory* i tekhnika eksperimenta, no. 1, 1964, 176-177

TOPIC TAGS: ferroprobe, magnetic rigidity, ferromagnetic film, gradient meter

ABSTRACT: Using the measuring circuit suggested by F. Förster (Z. Metallkunde, 1955, 46, no. 5, 358), a series of tests was conducted with a gradient meter. The latter consisted of two "half-probes," each having a primary and a secondary of 660 turns and an 80NKhS-permalloy core. A current of 21 ma at 23.5 kc was used. The magnetic rigidity was determined on the basis of measuring the demagnetizing field necessary to compensate for the

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ACCESSION NR: AP4018385

residual magnetism in the thin-film specimen. Orig. art. has: 4 figures.

ASSOCIATION: Institut fiziki SO AN SSSR (Institute of Physics, SO AN SSSR)

SUBMITTED: 07Feb63 DATE ACQ: 18Mar64 ENCL: 00

SUB CODE: PH NO REF SOV: 000 OTHER: 002

Card 2/2

YERSHOV, R.Ye.; RODICHEVA, E.K.; VOLGINA, Z.M.

Use of ferrosondes in determining the magnetic rigidity of thin ferromagnetic films. Prib. i tekh. eksp. 9 no.1:176-177 Ja-F '64. (MIRA 17:4)

1. Institut fiziki Sibirskogo otdeleniya AN SSSR.

VLASOV, A. Ya.; POPOVA, A.V.; ZVEGINTSEV, A.G.; RODICHEVA, E.K.

Palomagnetic investigation of Devonian sedimentary strata in the central part of Krasnoyarsk Territory. Izv. AN SSSR. Ser. geofiz. no.7:1022-1024 Jl '61. (MIRA 14:6)

1. Akademiya nauk SSSR, Sibirskoye otdeleniye, Institut fiziki.
(Krasnoyarsk Territory--Rocks--Mangetic properties)

DEYCHMAN, E.N.; RODICHEVA, G.V.

Interaction between indium sulfates and rubidium sulfates in aqueous solution. Zhur.neorg.khim. 6 no.9:2180-2186 S '61. (MIRA 14:9)

1. Institut obshchey i neorganicheskoy khimii im. N.S.Kurnakova Akademii nauk SSSR.
(Indium sulfate) (Rubidium sulfate)

DEYSHMAN, E.N.; RODICHEVA, G.V.; BRITSYNA, Zh.A.

Indium sulfates. System $In_2(SO_4)_3 - H_2SO_4 - H_2O$. Zhur.neorg.khim. 7 no.4:877-884 Ap '62. (MIRA 15:4)

1. Institut obshchey i neorganicheskoy khimii im. N.S.Kurnakova AN SSSR.

(Indium sulfates)

DEVYATKIN, B.V.; RODICHEVA, G.V.; CHELISHOV, I.A.

Synthesis of complex fluorosulfate and phosphate compounds of indium. Zhur. neorg. khim. 10 no.1:89-91 Ja '65.
(MIRA 18:11)

1. Institut obshchey i neorganicheskoy khimii imeni Kurnakova AN SSSR. Submitted Aug. 24, 1963.

TANANAYEV, I.V.; RODICHEVA, G.V.

Interaction between $UO_2(NO_3)_2$ and Na_2HPO_4 in aqueous solution. Atom. energ. 14 no.4:395-399 Ap '63. (MIRA 16:3)
(Uranyl nitrate) (Sodium phosphates)

S/089/63/014/004/008/019
A066/A126

AUTHORS: Tananayev, I.V., Rodicheva, G.V.

TITLE: Study of the reaction between $UO_2(NO_3)_2$ and Na_2HPO_4 in an aqueous solution

PERIODICAL: Atomnaya energiya, v. 14, no. 4, 1963, 395 - 399

TEXT: The system $UO_2(NO_3)O_2$ - Na_2HPO_4 - H_2O was studied by determining the solubility, pH, electrical conductivity, and apparent volume of the precipitates. The interaction in this system was found to proceed in three stages: 1) $n = Na_2HPO_4 : UO_2(NO_3)_2 = 0 - 0.67$. This part of the system is characterized by an excess of uranyl ions in the solution. Phosphorus was not detected in the solution. $(UO_2)_3(PO_4)_2$ is formed. 2) $n = 0.67 - 1.0$. The UO_2^{2+} concentration decreases systematically. There are no PO_4^{3-} ions, and $UO_2H_xNa_{1-x}PO_4$ is formed. 3) $n = 1 - 2$. The substitution of sodium ions for hydrogen ions is continued:

$$UO_2H_{1-x}Na_xPO_4 + (1 - x)\,Na^+ = NaUO_2PO_4 + (1 - x)\,H^+. \qquad (3')$$

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S/089/63/014/004/008/019
A066/A126

Study of the reaction between ....

$NaUO_2PO_4 \cdot nH_2O$ forms. The titrimetric determination of uranyl ions and of the free acidity in their salts is discussed. The optimum conditions for preparing compact precipitates of uranyl phosphate were found to be n = 1 - 1.5 and pH ≈ 2.5. There are 5 figures and 1 table.

SUBMITTED: June 9, 1962

Card 2/2

DEYCHMAN, E.N.; RODICHEVA, G.V.

Complex sulfates, oxalates, and mixed sulfatooxalates of indium.
Zhur.neorg.khim. 9 no.4:807-812 Ap '64. (MIRA 17:4)

1. Institut obshchey i neorganicheskoy khimii imeni Kurnakova AN SSSR.

S/078/62/007/004/011/016
B106/B101

AUTHORS: Deychman, E. N., Rodicheva, G. V., Britsyna, Zh. A.

TITLE: Study of indium sulfates. The system $In_2(SO_4)_3$ - H_2SO_4 - H_2O

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 4, 1962, 877-884

TEXT: The compounds forming in the system $In_2(SO_4)_3$ - H_2SO_4 - H_2O were studied by measuring the specific electrical conductivity, pH value, and solubility. The measurement of electrical conductivity was made in solutions with constant concentration of $In_2(SO_4)_3$ and varying quantities of sulfuric acid, as well as in an isomolar series. The following results were obtained: The acid salt $In_2(SO_4)_3 \cdot H_2SO_4$ or $InH(SO_4)_2$, which can also be considered as complex acid $H[In(SO_4)_2]$, is formed in solution and in the solid phase (in solution, the two forms are in dynamical equilibrium). Both forms are little stable, and dissociate in the solution according to: $H[In(SO_4)_2] \rightleftarrows H^+ + [In(SO_4)_2]^-$; $[In(SO_4)_2]^- \rightleftarrows [InSO_4]^+ + SO_4^{2-}$;

Study of indium sulfates. ...

$InH(SO_4)_2 \rightleftharpoons In^{3+} + H^+ + SO_4^{2-}$, respectively. In the presence of sulfate ions, no acidity range was found in which indium occurred as cation only. This indicates the formation of anion complexes of indium in strongly acid medium as well as at pH ~ 4. Determinations of solubility (Fig. 5) showed that the two hydrates $In_2(SO_4)_3 \cdot 10H_2O$ and $In_2(SO_4)_3 \cdot 5H_2O$ were stable in the concentration range 1-22% H_2SO_4. The acid indium sulfate $HIn(SO_4)_2 \cdot 3.5H_2O$ is formed in the concentration range 22-69% H_2SO_4. The two little stable complex acids $H_4In_2(SO_4)_5 \cdot 4H_2O$ and $H_3In(SO_4)_3$ which are formed besides the mentioned acid $H[In(SO_4)_2]$ were found for the first time in the concentration range 72-93% H_2SO_4. The solubility of complex indium acid is very low at a sulfuric acid content of 71% ($8 \cdot 10^{-7}$% $In_2(SO_4)_3$); therefore, practically no indium ions are present in the solution. In this manner, indium can be separated from some other elements which form soluble sulfates in solutions of ~ 70% sulfuric acid. The individual character of all compounds found in the system $In_2(SO_4)_3 - H_2SO_4 - H_2O$ was confirmed by

thermographic, crystal-optical, and x-ray diffraction studies. There are 7 figures and 3 tables.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov of the Academy of Sciences USSR)

SUBMITTED: April 7, 1961

Fig. 5. Solubility ($20^{\circ}C$) in the system $In_2(SO_4)_3 - H_2SO_4 - H_2O$.

[illegible], N., kand. tekhn. nauk; RODICHEVA, L., inzh.

Lighting of modern apartments. Tekh. est. 4 no.9:16-17 S '65. (MIRA 18:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy svetotekhnicheskiy institut (for Rodicheva).

Kobisheva, M. C.

PHASE I BOOK EXPLOITATION SOV/4159

Akademiya nauk SSSR. Komissiya po nauchnoy fotografii i kinematografii

Uspekhi nauchnoy fotografii, tom 7: Priroda fotograficheskoy chuvstvitel'nosti. Izgotovleniye galoidoserebryanykh fotograficheskikh sloyev. Opticheskaya sensibilizatsiya i gipersensibilizatsiya. Khimiko-fotograficheskaya obrabotka svetochuvstvitel'nykh sloyev (Nature of Photographic Sensitivity. Preparation of Haloid-Silver Photographic Layers. Optical Sensitizing and Hyper-Sensitizing. Chemical-Photographic Treatment of Photo-Sensitive Layers) Moscow, 1960. 260 p. Errata slip inserted. 1,800 copies printed.

Editorial Board: K.V. Chibisov (Resp. Ed.) Corresponding Member, Academy of Sciences USSR, V.I. Sheberstov (Deputy Resp. Ed.) Candidate of Chemical Sciences, Docent, Yu. N. Gorokhovskiy, Doctor of Chemical Sciences, Professor, G.A. Istomin, Doctor of Technical Sciences, Professor, and I.I. Levkoyev, Candidate of Chemical Sciences; Ed. of Publishing House: K.I. Markhilevich; Tech. Ed.: G.S. Simkina.

PURPOSE: This collection of articles is addressed to those working in theoretical and applied photography and cinematography, and to researchers in the chemistry and physics of photographic processes.

COVERAGE: The collection contains articles from the editorial files of the Zhurnal nauchnoy i prikladnoy fotografii i kinematografii discussing problems in the preparation and processing of haloid silver light-sensitive layers, the nature of photographic sensitivity, the preservability of photographic layers, the theory and technology of the preparation of photographic emulsions and optical sensitization, and, finally, the chemical photographic processing of black-and-white and color photographic materials. Many of the articles contain the results of scientific investigations made by the authors. The collection also includes several reviews of current problems in the theory of chemical-photographic processes. A bibliography of Soviet and non-Soviet references accompanies each article.

RODICHEVA, M.F.

Element composition of nuclear photographic emulsions. Usp. nauch. fot. 7:178-182 '60. (MIRA 13:7)
(Photographic emulsions) (Photography, Particle track)

RODICHEVA, M.F.

Element composition of K, LA-2 and T-3 nuclear emulsions.
Zhur.nauch.i prikl.fot.i kin. 5 no.3:221 My-Je '60.
(MIRA 13:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut.
(Photographic emulsions)

RODICHEVA, M.F.

More accurate methods for determining the chemical composition of nuclear track emulsions. Zhur.nauch.i prikl.fot.i kin. 5 no.2:144 Mr-Ap '60. (MIRA 14:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (NIKFI).
(Photographic emulsions) (Photography, Particle track)

RUDENKO, A.P.; BODRINA, D.E.; BALANDIN, A.A., akademik; KOLICHEVA, M.P.

Alkylation of benzene by a coaly substance obtained from propylene on silica gel. Dokl. AN SSSR 165 no.4:874-877 D '65. (MIRA 18:12)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.

RUDENKO, A.P.; RODICHEVA, M.F.; LEONT'YEV, Ye.A.; LUKINA, T.V. (Moscow)

"Macromechanism" of carbon formation in the decomposition of benzene on compressed carbon black. Zhur. fiz. khim. 38 no.3: 616-622 Mr '64. (MIRA 17:7)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

RODICHEVA, M.F.

Elemental composition of nuclear emulsions. Zhur.nauch. i prikl.fot. i kin. 3 no.4:286 Jl - Ag '58. (MIRA 12:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut.
(Photographic emulsions) (Silver halides)

RODICHEVA, M.F.

Elementary composition of nuclear photographic emulsions. Zhur. nauch. i prikl. fot. i kin. 3 no.4:286 Jl-Ag '58. (MIRA 11:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut.
(Photographic emulsions)

AUTHOR: Rodicheva, M.F. SOV 77-3-4-13/23

TITLE: The Elementary Composition of Nuclear Photographic Emulsions (Elementarnyy sostav yadernykh fotoemul'siy)

PERIODICAL: Zhurnal nauchnoy i prikladnoy fotografii i kinematografii, 1958, Vol 3, Nr 4, pp 286 (USSR)

ABSTRACT: The author used the method proposed by Swinnerton and Waller to determine the content of the elements in 17 batches of backing-less type R emulsion films from NIKFI. The carbon and hydrogen content were found by the microanalytic method and the nitrogen content by a combination of Dumas' microanalytical method with the macromethod of Kieldale. The results are set out in tabular form. A more detailed report is in preparation. There is 1 table and 1 non-Soviet reference.

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The Elementary Composition of Nuclear Photographic Emulsions SOV 77-3-4-13/23

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (The All-Union Research Institute for Photography and Cinematography)

SUBMITTED: April 9, 1958

1. Photographic emulsions--Microanalysis 2. Carbon--Determination
3. Hydrogen--Determination 4. Nitrogen--Determination

Card 2/2

VASIL'YEV, V.V.; RODICHEVA, N.A.

Preparation of a solution for the detection of anions. Vest.LGU 16 no.10:145-147 '61. (MIRA 14:5)
(Anions) (Hydrogen-ion concentration)

VASIL'YEV, V.V.; RODICHEVA, N.A.

Qualitative chemical semimicroanalysis. Driving off ammonium salts. Uch.zap.LGU no.272:149-152 '59. (MIRA 13:1)
(Ammonium salts)
(Chemistry, Analytical--Qualitative)

Kopitsheva, N. A.

P. 5

5(2) PHASE I BOOK EXPLOITATION SOV/2946

Leningrad. Universitet

Voprosy khimii (Problems in Chemistry) [Lengingrad] Izd-vo Leningradskogo univ., 1959. 160 p. (Series: Its: Uchenyye zapiski, no. 272) (Series: Leningrad. Universitet. Khimicheskiy fakultet. Uchenyye zapiski. Seriya khimicheskikh nauk, vyp. 18) 1,600 copies printed.

Resp. Ed.: A. G. Morachevskiy; Ed.: Ye. V. Shchemeleva; Tech. Ed.: S. D. Vodolagina.

PURPOSE: This book is intended for chemists in research and industry as well as for teachers and students in chemical vuzes.

COVERAGE: This collection of eighteen articles on various branches of chemistry, mainly physical and analytical, was compiled on the basis of experimental research by the Chemistry Department of Leningrad University. The articles deal chiefly with methods of isolating rare earths in pure form and identifying them. No

Card 1/5

personalities are mentioned. References accompany individual articles.

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AVAILABLE: Library of Congress

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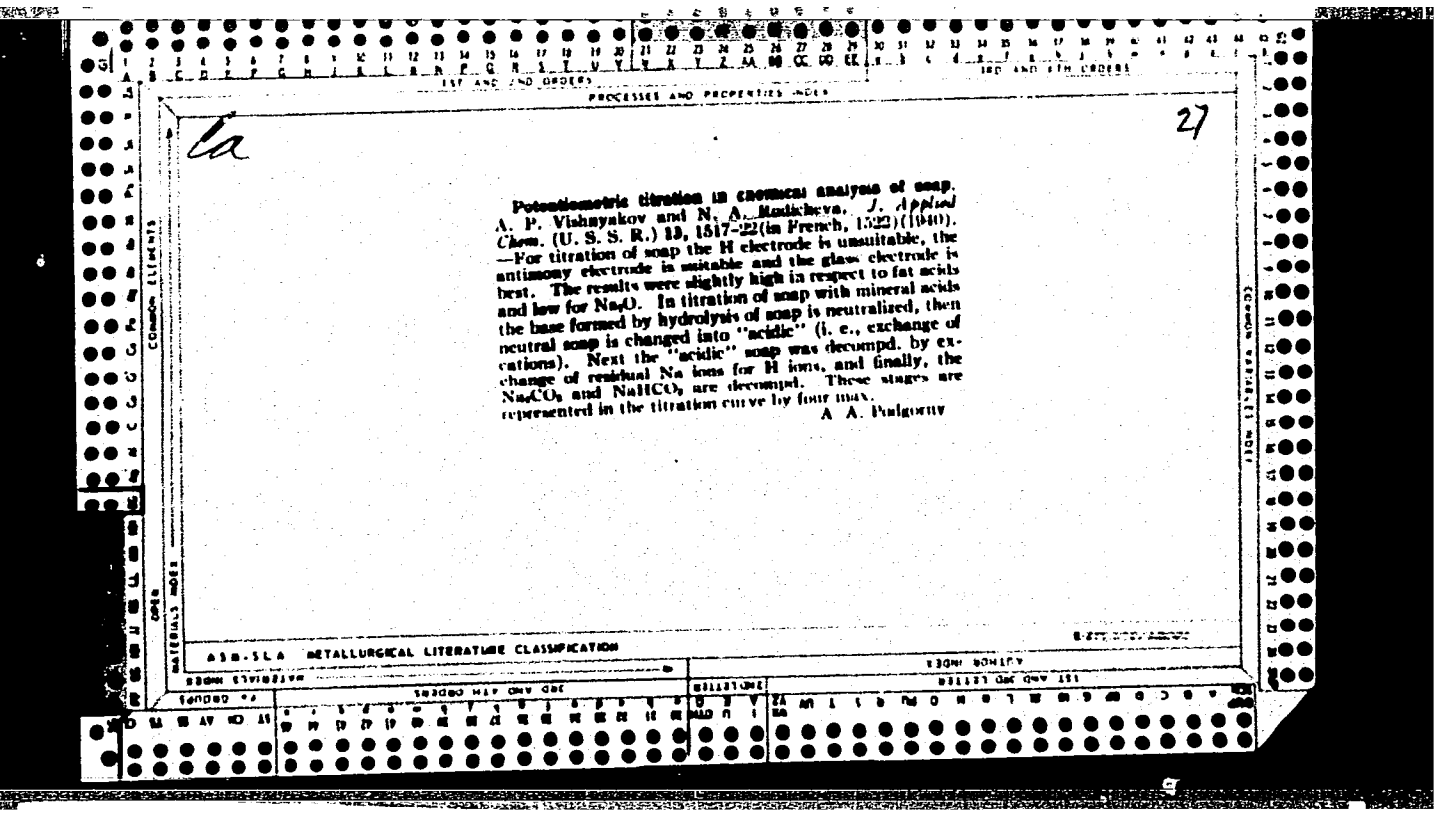

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Potentiometric titration in chemical analysis of soap. A. P. Vishnyakov and N. A. Rudakova. *J. Applied Chem.* (U. S. S. R.) **13**, 1517-22(in French, 1522)([1940]). —For titration of soap the H electrode is unsuitable, the antimony electrode is suitable and the glass electrode is best. The results were slightly high in respect to fat acids and low for Na_2O. In titration of soap with mineral acids the base formed by hydrolysis of soap is neutralized, then neutral soap is changed into "acidic" (i. e., exchange of cations). Next the "acidic" soap was decompd. by exchange of residual Na ions for H ions, and finally, the Na_2CO_3 and $NaHCO_3$ are decompd. These stages are represented in the titration curve by four max.

A. A. Bulgarov

STRUKOV, B.A.; MINAYEVA, K.A.; RODICHEVA, Ye.N.

Repolarization characteristics of acid ammonium sulfate $(NH_4)HSO_4$.
Fiz. tver. tela 6 no.1:76-79 Ja '64. (MIRA 17:2)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

L 7835-66 EWP(e)/EPA(s)-2/EWT(m)/EWP(i)/EPA(w)-2/EWP(t)/EWP(b)/EWA(h)
ACC NR: AP5028118 IJP(c) JD/WH SOURCE CODE: UR/0048/65/029/011/2050/2054

AUTHOR: Fedulov,S.A.; Fel'dman,N.B.; Rodicheva,Ye.N. 78

ORG: All-Union Scientific Research Institute of Chemical Reagents and High Purity Chemicals (Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reakitvov i osobo chistykh khimicheskikh veshchestv)

TITLE: Investigation of lead titanate - lanthanum titanate solid solutions [Report, Fourth All-Union Conference on Ferro-electricity held at Rostov-on-the Don 12-16 September 1964]

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 11, 1965, 2050-2054

TOPIC TAGS: ferroelectric material, piezoelectric ceramic, solid solution, lead, lanthanum, titanate, dielectric constant, dielectric loss, Curie point, lattice parameter, electric polarization, piezoelectric modulus

ABSTRACT: The ferroelectric and piezoelectric properties of $(1 - x)PbTiO_3 + xLa_{2/3}TiO_3$ solid sclutions were investigated. The specimens were synthesized from the oxides by a special ceramic technique described in an Inventor's Certificate by I.A.Grozman, L.Z.Rusakov, and N.B.Fel'dman (Avtor. svid. No. 135394 ot 25 marta 1960) and involving 2-hour roastings at 910 and 1180-1270°C. X-ray studies showed that solid solutions were formed for values of x up to 0.5 and above. The volume of the unit cell decreased with increasing x; from this it is concluded that the trivalent

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ACC NR: AP5028118 O

lanthanum ions replace the divalent lead rather than the tetravavelent titanium ions. The dielectric constant and electric conductivity were measured at different temperatures, dielectric hysteresis loops were observed, and the piezoelectric properties were investigated by the resonance method. The solid solutions showed both ferroelectric and piezoelectric properties. The Curie temperature decreased with increasing x from approximately 500°C for x = 0 to 0°C for x = 0.5; this decrease of the Curie temperature is ascribed to the fact that the trivalent lanthanum ions are considerably less polarizable than the divalent lead ions that they replace. The radial electromechanical coupling constants of polarized specimens ranged between 0.1 and 0.2, the piezoelectric activity increasing with increasing x. The electric conductivities of the solid solutions were in general less than that of pure lead titanate. By extrapolating hysteresis loop measurements to x = 0, values of 4 kV/cm and 50 $\mu C/cm^2$ were found for the coercive field and spontaneous polarization of lead titanate. This value of the polarization is in good agreement with the finding of G.Shirane and S.Hochino (proc. Inst. Rad. Engrs., 43, No. 12, 1738 (1955)), but the value 90-100 $\mu C/cm^2$ calculated from the latent heat of the phase transformation is believed to be more nearly correct. The discrepancy is ascribed to the use of ceramic specimens rather than single crystals. It is concluded that the investigated materials will find practical application, owing to their rather high Curie points and their appreciable piezoelectric activities. Orig. art. has: 6 figures.

SUB CODE: SS,EM,ME SUBM DATE: 00/ ORIG. REF: 007 OTH REF: 005

Card 2/2 bmp

ACCESSION NR: AP4011740 S/0181/64/006/001/0076/0079

AUTHORS: Strukov, B. A.; Minayeva, K. A.; Rodicheva, Ye. N.

TITLE: Reverse polarization characteristics of acid ammonium sulfate

SOURCE: Fizika tverdogo tela, v. 6, no. 1, 1964, 76-79

TOPIC TAGS: acid ammonium sulfate, reverse polarization, dielectric hysteresis, dielectric hysteresis loop, coercive field, pulsing reversal, pulsing polarity reversal

ABSTRACT: The authors made this study because of lack of information in the literature on pulsing polarity reversals in $(NH_4)HSO_4$. In the temperature interval from -2.5 to -119C this mineral has a rectangular dielectric hysteresis loop in a relatively small coercive field (on the order of 200-600 v/cm). This property makes the mineral of considerable practical importance. The characteristics of the polarity reversal were measured under carefully controlled stabilized temperature. These tests were made in the range from -20 to -100C. The samples (10 x 10 x 40 mm) were given rectangular pulses, the amplitudes and durations of which ranged from 0 to 120 v and 10 to 1200 microseconds respectively. The build-up time of the pulse did not exceed 0.1 microsecond. The frequency of pulse repetition was 250

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cycles. The authors have shown that, as with other ferroelectric crystals, the W. Merz model (Phys. Rev., 95, 690, 1954) may be used for the pulsing reversals of polarization. Near the points of ferroelectric phase transition (-2.5 and -119C) spontaneous depolarization was detected in the samples. Orig. art. has: 7 figures and 1 table.

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PA 67/49T77

USSR/Medicine - Plants, Poisonous Aug 49
Poisons

"'Poison Plush' [Toxicodendron radicans L. Ktze]," G. I. Rodienko, 2½ pp

"Priroda" No 8

"Poison plush" does not grow wild in the USSR, but the Toxicodendron orientale Greene, with the same properties, grows on Southern Sakhalin and the Kurile Islands. Few people are naturally immune to it. Illustrations show the plant and an arm poisoned by it.

FDD 67/49T77

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